Welcome to Boston
ASTRO’s 54th Annual Meeting
“Advances in Prostate Cancer” News Briefing

Tuesday, October 30, 2012
3:15 p.m. – 4:00 p.m.

Colleen Lawton, MD, FASTRO
President, ASTRO
Patient-Reported Quality of Life in Prostate Cancer Patients Treated With 3D Conformal, Intensity-Modulated or Proton Beam Radiotherapy

Phillip J. Gray, Jonathan J. Paly, Beow Y. Yeap, Martin G. Sanda, James A. Talcott, Howard M. Sandler, Jeff M. Michalski, Daniel A. Hamstra, Justin E. Bekelman and Jason A. Efstathiou
Utilization of IMRT: SEER Data

- IMRT
- 3-D CRT

Percent of Radiotherapy for Prostate Cancer

US Proton Therapy Centers

- Proton center in operation
- Proton center under construction
- Proton center in development
Patient Reported Bowel Toxicity

3-D CRT

Bowel/Rectal Domain

Follow-up (months)

0 3 12 24

Absolute Instrument Score

0 60 70 80 90 100

*: Clinically meaningful change

Proton Beam

Bowel/Rectal Domain

Follow-up (months)

0 3 12 24

Absolute Instrument Score

90 100

*: Clinically meaningful change

IMRT

Bowel/Rectal Domain

Follow-up (months)

0 2 6 12 24

Absolute Instrument Score

80 90 100

*: Clinically meaningful change
Patient Reported Urinary Toxicity

3-D CRT

Proton Beam

IMRT

*: Clinically meaningful change

Urinary Irritation/Obstruction Domain

Follow-up (months)

Absolute Instrument Score

0 3 12 24

Follow-up (months)

0 6 12 24

Follow-up (months)

0 2 6 12 24

Follow-up (months)

0 2 6 12 24
N=350

Low-Intermediate Risk Prostate Cancer

Randomize

79.2 Gy

IMRT

Patient-Reported Quality of Life
Cost-Effectiveness
Physics/Biology

Proton Beam

ENDPOINTS

79.2 Gy (RBE)

clinicaltrials.gov identifier: NCT01617161
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A Decision Analysis to Assess the Value of Prostate Cancer Screening:

A Shift in Focus from Prostate Cancer Specific Mortality to Distant Metastasis Free Survival

Arie Pablo Dosoretz, Nataniel H. Lester-Coll, Shiyi Wang, and James B. Yu
Yale Department of Therapeutic Radiology, New Haven, CT
Prostate Cancer Screening

• Prostate Cancer is the 2nd leading cause of cancer deaths among men in the United States, with over 28,000 deaths estimated for 2012

• The value of screening men for prostate cancer using prostate-specific antigen (PSA) testing has generated significant debate

• Criticisms of screening include:
  – False-positive rates associated with PSA testing
  – Harms associated with work-up and prostate biopsies
  – Over-diagnosis and over-treatment

• Randomized-Control Trial Evidence includes:
  – PCLO Study: Included 76,685 men in the United States, aged 55-74, and found no statistically significant overall survival or prostate-cancer specific mortality differences from annual PSA testing
  – ERSPC study: Included 162,388 European men, aged 55-69, and found a 20% reduction in prostate cancer mortality, but no overall mortality benefit from PSA testing every 4 years

• In May of 2012, the United States Preventive Services Task Force (USPSTF) concluded “…that there is moderate certainty that the benefits of PSA-based screening for prostate cancer do not outweigh the harms.”
Purpose
To determine the quality-adjusted life expectancy (QALE) associated with screening men for prostate cancer with annual PSA testing

Methods
• A mathematical model (state transition Markov model) was constructed to compare QALE in men with and without annual PSA screening

• Men screened and found to be positive, after a confirmatory work-up, were assumed to have clinically localized, low-risk prostate cancer

• Unscreened men, who presented with prostate cancer, were also assumed to have low-risk prostate cancer, but could also present with metastatic disease

• All men with prostate cancer were assumed to undergo treatment with intensity-modulated radiation therapy (IMRT)

• Probabilities of transitioning between health states and quality of life values (utilities) for each state were entered into the model from a literature review

• Enhanced model constructed, included each risk group of prostate cancer and more detailed inclusion of possible toxicities from treatment
Results from Initial Model

- QALE benefit found for all ages
- Benefit diminished with increasing age
- Model sensitive to probability of developing metastatic disease without screening
- If 10-year probability was less than 4.9%, no-screening became the preferred strategy
Structure of Enhanced Model - Screening

- NED
- PSA +
- Work-Up
- True positive
- Low Risk CA IMRT
- Int. Risk CA IMRT + STADT
- High Risk CA IMRT + LTADT
- NED after False Positive
- NED w/o Adverse Effects
- DM
- Develop Toxicity
- ED
- GU
- GI
- NED w/o Adverse Effects
- DM
- Death from Other Cause
- DM
- PCSM
- Death from Other Cause
- PCSM
Results from Enhanced Model

- Other factors found to influence QALE and preferred strategy, including:
  - Incidence of prostate cancer
  - Proportion of men in the unscreened group presenting with distant metastatic disease
  - Probability of developing long-term adverse effects from treatment
Conclusions

• The decision to screen an individual or a population of men for prostate cancer is complex and nuanced

• Our model suggests that there may be a quality of life benefit associated with screening certain populations of men for prostate cancer with PSA testing

• Several factors were found to influence the quality of life effects of screening, including:
  – The proportion of unscreened men presenting with distant metastatic disease
  – The incidence of prostate cancer in the population
  – The probability of developing adverse effects from prostate cancer treatment

• Further research is needed in order to more thoroughly understand the impact of screening on quality of life and to optimize screening strategies
WELCOME to Boston
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PROSTATE SBRT POOLED ANALYSIS

Alan J. Katz MD, JD, Flushing Radiation Oncology Flushing, NY
Debra Freeman, MD, CK Center of Tampa Bay
Joseph Aronovitz, MD, Beth Israel Deaconess, Boston
Sean Collins, MD, Georgetown University Hospital, Washington
G. Bolzicco, MD, San Bortolo Hospital, Vicenza, Italy
Christopher King, MD, PhD, Michael Steinberg, MD, and Jason Wang, PhD, UCLA Medical Center
Donald Fuller, MD, CK of San Diego
Robert Meier, MD, Swedish Medical Center, Seattle
PATIENTS TREATED

• 1101 total
• Low, intermediate and high risk included
• All received CK Stereotactic Body Radiation Therapy to dose of 35-40 Gy in 4-5 fractions
• This involves accurate delivery of treatment with small margins and real time tracking
• Median follow-up of 36 months (range 6-72)
• 465 pts with at least 4 year follow-up
Actuarial 5-Year Biochemical Control

Kaplan-Meier Cum. Survival Plot for True_Fail_T
Censor Variable: True_Fail
Grouping Variable: Risk_G_dAmico

Low risk 95%
Intermediate 90%
High risk 80%
By Dose group:
≤35 vs 36-37 vs 38-40 Gy

Kaplan-Meier Cum. Survival Plot for Fail_n_2_T
Censor Variable: Fail_n_2
Grouping Variable: Dose Grp

Logrank p=0.17
BY ADT USE

Kaplan-Meier Cum. Survival Plot for Fail_n_2_T
Censor Variable: Fail_n_2
Grouping Variable: ADT

Cum. Survival

Time

Censor Times (Y)
Cum. Survival (Y)
Censor Times (N)
Cum. Survival (N)

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ANNUAL MEETING
SCIENCE BASED, PATIENT DRIVEN
Advancing Patient Care through iNNOVATION
IMPLICATIONS FOR PATIENT CARE AND HEALTH CARE COSTS

1. These results are superior to standard treatment (IMRT) of 40-45 days in terms of control.
2. These results should encourage men to seek SBRT as a viable alternative to IMRT, brachytherapy or surgery.
3. Supports the hypothesis that prostate cancer has great sensitivity to dose per fraction.
4. No need for hormone ablation.
5. Huge savings in time for the patients and in costs to the payers. (Medicare 22K vs 40-45 K)
Conclusions
• Sildenafil citrate was associated with improved sexual function outcomes after radiotherapy when given to patients during and after RT for patients with prostate cancer.
• When controlled for baseline IIEF and age of patient significant improvement of the post-treatment IIEF and overall satisfaction of function was observed for those who took sildenafil citrate.
• Differences between the treatment groups became less apparent beyond 12 months from treatment.
• No benefit for this intervention was noted among patients treated with ADT.
Stereotactic Body Radiotherapy for Intermediate-risk Organ-confined Prostate Cancer: Interim Toxicity and Quality of Life Outcomes from a Multi-Institutional Study

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SBRT: Ultra-precise delivery of very high-dose radiation using converging, finely collimated beams

• All patients had **stage IIA** prostate cancer: at risk for cancer death due to Gleason score 7 or PSA>10

• **129 patients** enrolled: Dec 2007 – April 2010

• **21 institutions**

• Follow-up: 2 - 4½ years, median **3 years**
SBRT Delivered with CyberKnife in 5 Sessions

- CyberKnife concentrates over 100 radiation beams into target
- Robot continuous tracks the prostate and corrects for motion
- Treats with sub-mm accuracy
- Minimizes radiation to rectum, bladder, urethra and nerves
Urinary Side Effects after SBRT

Quality of Life: EPIC Score

Urinary Score

Months after SBRT

0 6 12 18 24 30 36
Bowel Side Effects after SBRT

Quality of Life: EPIC Score

Bowel Score

Months after SBRT

0 6 12 18 24 30 36

70 80 90 100
CyberKnife SBRT for Stage IIA Prostate CA - 5 days rather than 8 weeks of treatment - Very high cancer control rates - Quality of life returns to normal - Long-term side effects similar or less than other radiation modalities

Address questions to bob.meier@swedish.org

Probability of Freedom From Disease
PSA failure: 2ng/ml rise after current nadir

100%
99.2%
80%
60%
40%
20%
0%

Years Post Treatment (# pts)
0 (129) 1 (122) 2 (114) 3 (72) 4 (17)

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Advancing Patient Care through iNNOVATION
Q & A
For additional questions or interviews, please contact the ASTRO Press Office
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